CLAIMS

1. A molding method for moldable bio-substance material, comprising:

(1) crushing the bio-substance materials into an incompact state and then extruding them for further molding through a molding die;

(2) forming at least a wedged extruding cavity between an extruding head and an extruding surface of the molding die;

(3) passing the bio-substance materials in the incompact state through an action of a relative movement between the extruding head and the extruding surface of the molding die at differential speeds; and

(4) grinding the particles of the bio-substance materials extruded between the extruding head and the extruding surface, and then twisting, stretching and flaking said bio-substance materials, and meanwhile extruding the same to a small end of the wedged extruding cavity and further forcing them into a molding cavity of the molding die to be molded.

2. The molding method according to claim 1, wherein said wedged extruding cavity can be formed between an end surface of the extruding head and the extruding surface of the molding die, and said bio-substance materials enter the extruding cavity from a large end of said wedged extruding cavity.

3. The molding method according to claim 2, wherein the end surface of the extruding head forms at least a slope surface; the wedged extruding cavity is formed between said slope surface and the extruding surface of the molding die; the extruding cavity is arranged along the opposite direction of the movement of the extruding head from the large end to a small end thereof; and said bio-substance materials are grinded, twisted up, and extruded to the small end of the wedged extruding cavity and meanwhile extruded into the molding cavity when the extruding head moves relatively to the extruding surface of the molding die.

4. The molding method according to claim 3, wherein said end surface of the extruding head and the extruding surface of the molding die have, in between, a coordinative clearance of less than 3mm.

5. The molding method according to claim 2, wherein said relative movement between the extruding head and the extruding surface of the molding die is a relative parallel movement in between.

6. The molding method according to claim 5, wherein said parallel movement between the extruding head and the molding die is caused by their opposite movements.

7. The molding method according to claim 5, wherein said parallel movement between the extruding head and the molding die is caused by their differential speed moving in the same direction.

8. The molding method material according to claim 2, wherein said molding cavity is arranged at an angle toward the end surface of the molding die.

9. The molding method according to claim 8, wherein said molding cavity arranged at an angle to the end surface of the molding die has an oriented section.

10. The molding method according to claim 5, wherein said molding cavity is a flute distributed along the extruding surface of the molding die.

11. The molding method according to claim 1, wherein said extruding head is made from a rolling body, and the wedged extruding cavity is formed between the rolling surface of the extruding head and the extruding surface of the molding die.

12. The molding method according to 11, wherein said extruding head made from the rolling body is either cylindrical or conic.

13. The molding method according to claim 11, wherein said relative movement between the extruding head and the molding die is a composite movement formed between an axial self-rotation of the extruding head and a linear movement of the molding die.

14. The molding method according to claim 13, wherein the direction of said axial self-rotation of the extruding head is opposite to the direction of the linear movement of

the molding die.

15. The molding method according to claim 14, wherein said relative movement is a differential speed movement in the same direction of the axial self-rotation of the extruding head and the linear movement of the molding die.

16. The molding method according to claim 15, wherein the linear speed of said axial self-rotation of the extruding head is larger than the linear moving speed of the molding die.

17. The molding method according to claim 11, wherein said relative movement between the extruding head and the molding die is composed of an axial self-rotation of the extruding head and a revolution of the extruding head relatively using the molding die as an axe of the rotation.

18. The molding method according to claim 17, wherein the relative movement of the extruding head and the molding die is composed of the axial self-rotation of the extruding head and the revolution of the extruding head relative to the molding die as an axe of rotation.

19. The molding method according to claim 17, wherein said relative movement of the extruding head to the molding die is composed of the axial self-rotation of the extruding head and an axial self-rotation of the molding die.

20. The molding method according to claim 19, wherein the movements of the extruding head and the molding die are in opposite direction between the axial self-rotation of the extruding head and the revolution of the extruding head using the molding die as a rotation axe.

21. The molding method according to claim 19, wherein the relative movement is a differential speed movement in the same direction between the said axial self-rotation of the extruding head and the revolution of the extruding head using molding die as a rotation axe.

22. The molding method according to claim 21, wherein the linear speed of the axial self-rotation of the extruding head is greater than the revolution speed of the extruding head using the molding die as the rotation axe.

23. The molding method according to claim 13, wherein the extruding surface of the molding die is a plane; said wedged extruding cavity is formed between the rolling surface of the extruding head and the extruding surface of the molding die, and the materials enter into the extruding cavity along the large end of the wedged extruding cavity.

24. The molding method according to claim 17, wherein said extruding surface of the molding die is an arc, and the curvature radius of the extruding arc surface is greater than the rotation radius of the extruding head; and said wedged extruding cavity is formed between the rolling surfaces of the extruding head and the extruding surface of the molding die, and the bio-substance materials enter into the extruding cavity along the large end of the wedged extruding cavity.

25. The molding method according to claim 23, wherein a large end of the wedged extruding cavity has an opening facing upwards, and the bio-substance materials are extruded into the extruding cavity and moved to a small end by gravity and friction produced between the extruding head and the extruding surface.

26. The molding method according to claim 11, wherein said molding cavity of the molding die is arranged at an angle relatively to the extruding surface of the molding die.

27. The molding method according to claim 26, wherein an oriented section is set for the molding cavity which is arranged at an angle to the extruding surface of the molding die.

28. The molding method according to claim 11, wherein said molding cavity of the molding die is distributed over multiple flutes on the extruding surface of the molding die.

29. A molding apparatus for moldable bio-substance material, comprising

(1) at least an extruding head driven by power;

(2) a molding die having an extruding surface and a molding cavity;

(3) a wedged extruding cavity formed at least between the extruding head and the extruding surface of the molding die, and having a large end and a small end; and

(4) a material inlet provided at the large end of the wedged extruding cavity, through which particles of the bio-substance materials enter into the extruding cavity to be grinded, twisted up, stretched, flaked due to an action of relative movement between the extruding head and the extruding surface of the molding die, and meanwhile to be molded in the molding cavity of the molding die.

30. The molding apparatus according to claim 29, wherein said wedged extruding cavity is formed between the end surface of the extruding head and the extruding surface of the molding die, and the bio-substance material enter the extruding cavity from the large end.

31. The molding apparatus according to claim 30, wherein at least one slope surface is formed on the end surface of extruding head; the wedged extruding cavity is formed by this slope surface and the extruding surface of the molding die; the extruding cavity is arranged along an opposite direction of the large end to small end movement of the extruding head; and the material will be grinded, twisted up, and at the same time extruded to the small end of extruding cavity and then into molding cavity, when the extruding head moves relatively to the extruding surface of the molding die.

32. The molding apparatus according to claim 39, wherein the slope surface of the end surface of the extruding head can be two or more with uniform distribution.

33. The molding apparatus according to claim 31, wherein the coordination clearance between the end surface of the extruding head and the extruding surface of the molding die is less than 3mm.

34. The molding apparatus according to claim 31, wherein the relative movement between the end surface of the extruding head and the extruding surface of the molding die is relative slipping movement.

35. The molding apparatus according to claim 32, wherein the slope surface of the end surface of the extruding head is annularly distributed with the axe of its rotation.

36. The molding apparatus according to claim 31, wherein the relative movement between the extruding head and the molding die is relatively parallel.

37. The molding apparatus according to claim 36, wherein one of the extruding head and the molding die is static, and the other is moving parallel relative to the static one.

38. The molding apparatus according to claim 36, wherein the relatively parallel movement between the extruding head and the molding die is in opposite direction with each other.

39. The molding apparatus according to claim 36, wherein the relatively parallel movement between the extruding head and the molding die is a differential speed movement in the same direction.

40. The molding apparatus according to claim 32, wherein the slope surface of the end surface for the extruding head is vertically distributed with respect to the direction of its movement.

41. The molding apparatus according to claim 31, wherein the end surface of the molding cavity is set at an angle to the molding die.

42. The molding apparatus according to claim 41, wherein an oriented section is set in the extruding cavity that is arranged at an angle to the extruding surface of the molding die.

43. The molding apparatus according to claim 42, wherein the height of the large end of the molding cavity oriented section is no greater than 10mm.

44. The molding apparatus according to claim 31, wherein the molding cavity is composed of multiple flutes distributed along the extruding surface of the molding die.

45. The molding apparatus according to claim 29, wherein the extruding head is composed of a rolling body; and the wedged extruding cavity is formed between the rolling

surface of the extruding head and the extruding surface of the molding die.

46. The molding apparatus according to claim 45, wherein the rolling body forming the extruding head is cylindrical or conic.

47. The molding apparatus according to claim 45, wherein the extruding surface of the molding die is a plane; the wedged extruding cavity is formed between the rolling surface of the extruding head and the extruding surface of the molding die; and the bio-substance materials enter the extruding cavity from the large end of the wedged extruding cavity.

48. The molding apparatus according to claim 45, wherein the extruding surface of molding die is in a arc shape; the curvature radius of the extruding arc surface is greater than the rotation radius of the extruding head; the wedged extruding cavity is formed between rolling surface of the extruding head and extruding surface of the molding die; and the bio-substance materials enter the extruding cavity through the large end of wedged extruding cavity.

49. The molding apparatus according to claim 47, wherein the large end of wedged extruding cavity has an opening facing upwardly; the bio-substance materials are extruded to enter the extruding cavity and then to the small end by gravity and friction generated between the extruding head and the extruding surface.

50. The molding apparatus according to claim 45, wherein the relative movement between the extruding head and the molding die is a compositive movement, including an axial self-rotation of the extruding head and a linear movement of the molding die.

51. The molding apparatus according to claim 45, wherein one of the extruding head and the molding die is static, and the other moves relatively to the static one.

52. The molding apparatus according to claim 50, wherein the direction of the axial self-rotation of the extruding head is opposite to the direction of the linear movement of the molding die.

53. The molding apparatus according to claim 50, wherein said relative movement between the axial self-rotation of the extruding head and linear movement of the molding die is a differential speed movement in the same direction.

54. The molding apparatus according to claim 52, wherein the linear speed of the axial self-rotation of the extruding head is larger than the speed of the linear movement of the molding die.

55. The molding apparatus according to claim 45, wherein the relative movement between the extruding head and molding die is a composite movement, including the axial self-rotation of the extruding head and the common revolution of the extruding head using molding die as a rotation axle.

56. The molding apparatus according to claim 55, wherein the relative movement between the extruding head and the molding die is a composite movement, including the axial self-rotation of the extruding head and the common revolution of the extruding head using extruding die as a rotation axle.

57. The molding apparatus according to claim 55, wherein the relative movement between the extruding head and the molding die is a composition movement, including the axial self-rotation of the extruding head and the axial self-rotation of the molding die.

58. The molding apparatus according to claim 56, wherein the direction of the axial self-rotation of the extruding head is opposite to the direction of the common revolution of extruding head using molding die as a rotation axle.

59. The molding apparatus according to claim 56, wherein the movement between the axial self-rotation of the extruding head and the common revolution of the extruding head using molding die as a rotation axle is a differential speed movement in the same direction.

60. The molding apparatus according to claim 59, wherein the linear speed of the extruding head axial self-rotation is greater than the revolution speed of the extruding head relative to the molding die.

61. The molding apparatus according to claim 45, wherein the molding cavity of the molding die is set at an angle relative to the extruding surface of the molding die.

62. The molding apparatus according to claim 61, wherein an oriented section is set on the molding cavity, and has an angle to the extruding surface of the molding die.

63. The molding apparatus according to claim 62, wherein the height of the large end is no greater than 10mm in the oriented section of the molding cavity.